



LB8681CL — Monolithic Digital IC

Constant Current Driver IC with H-bridge × 1.5 Channel

Overview

The LB8681CL is a low-voltage, low-saturation 1.5-channel constant current forward/reverse driver IC provided in a miniature package suitable for use in cell phone cameras. The LB8681CL can be driven directly from a microcontroller and is optimal for control of the voice coil motors used for shutter and aperture control in cell phone cameras.

Features

- Supports low-voltage drive. (2.2V or more)
- Ultraminiature package (ECSP2828-10)

Functions

- Constant current control ($I_{OUT} = 100\text{mA}$ at $R_F = 2\Omega$)
- Built-in thermal protection circuit
- Built-in reference voltage (0.2V typical)
- Built-in spark killer diode

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		-0.3 to +8.0	V
Output voltage	V_{OUT} max	OUT1, OUT2, OUT3	$V_{CC} + V_{SF}$	V
Input voltage	V_{IN} max	IN1, IN2, IN3	-0.3 to +8.0	V
Ground pin source current	IGND	Per channel	400	mA
Allowable power dissipation	P_d max	When mounted on a circuit board *	450	mW
Operating temperature	T_{opr}		-30 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

* Specified circuit board : $20.0 \times 10.0 \times 0.8\text{mm}^3$, paper-phenol

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Allowable Operating Ranges at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_{CC}		2.2 to 7.5	V
High-level input voltage	V_{IH}	IN1, IN2, IN3	1.8 to 7.5	V
Low-level input voltage	V_{IL}		-0.3 to 0.7	V

Electrical Characteristics at $T_a = 25^\circ\text{C}$, $V_{CC} = 3.3\text{V}$

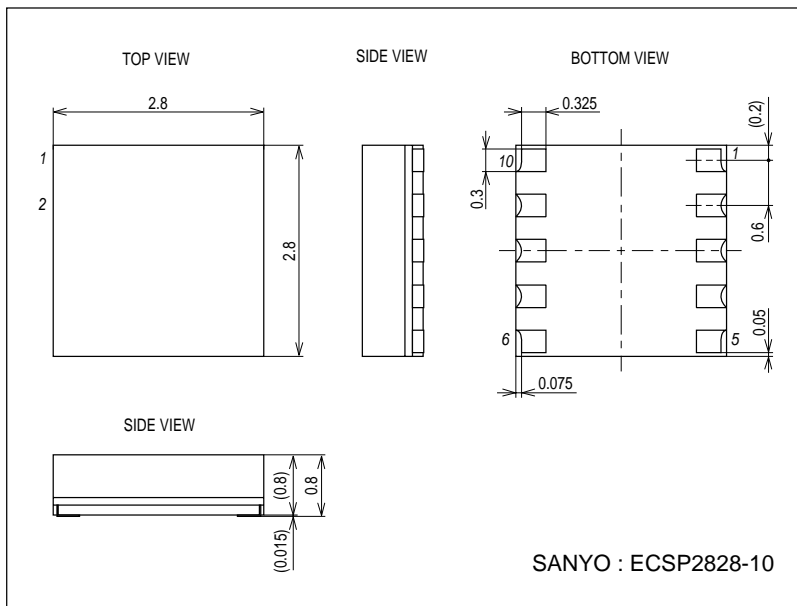
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current	I_{CC0}	IN1 = IN2 = IN3 = 0V		0.1	1	μA
	I_{CC1}	IN1, IN2, or IN3 = 3V		13.9	18	mA
Output saturation voltage	V_{OUT1}	IN1, IN2, or IN3 = 3V, $I_{OUT} = 100\text{mA}$		0.20	0.32	V
	V_{OUT2}	IN1, IN2, or IN3 = 3V, $I_{OUT} = 200\text{mA}^*$		0.41	0.62	V
Output constant current	I_{OUT1}	Between REF and GND : 2Ω	95	100	105	mA
	I_{OUT2}	Between REF and GND : $1\Omega^*$	190	200	210	mA
Input current	I_{IN}	$V_{IN} = 3\text{V}$		40	60	μA
Spark killer diode						
Reverse current	$I_{S(\text{leak})}$				1	μA
Forward voltage	VSF	$I_{OUT} = 200\text{mA}^*$			1.7	V

* Design guarantee: These characteristics are design targets and are not measured.

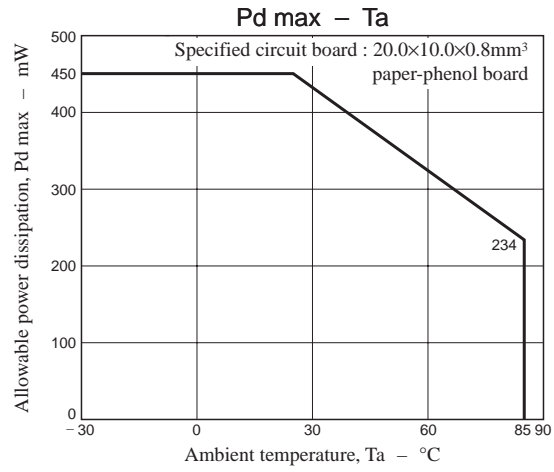
Package Dimensions

unit : mm (typ)

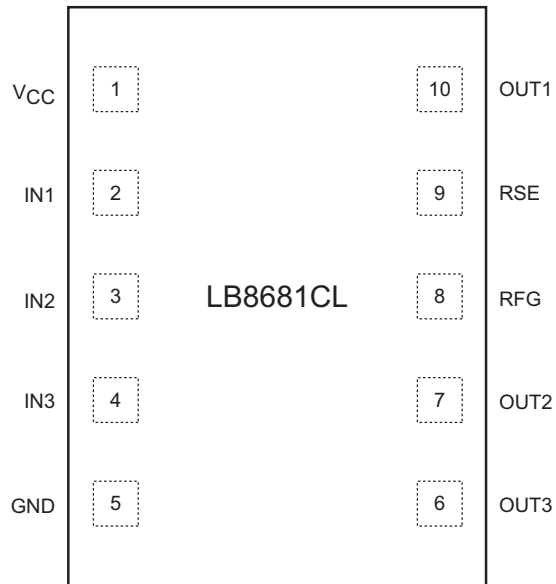
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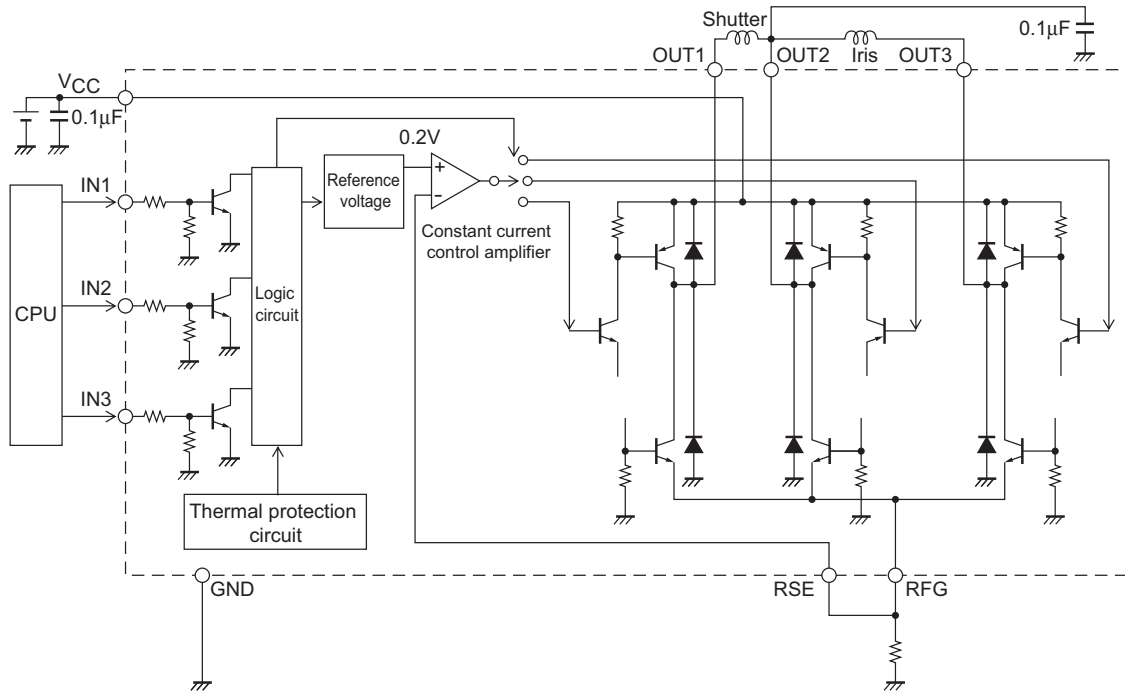


Pin Assignment



Top View

Block Diagram



[Constant current formula] $I_{OUT} = 0.2 \div R_F$

When V_{CC} is high, the $0.01\mu F$ capacitor may be inserted between OUT and OUT.

Truth Table

Input			Output			Notes	
IN1	IN2	IN3	OUT1	OUT2	OUT3		
Low	Low	Low	-	-	-	Shutter	
	High	Low	High	Low	-		Forward
	Low	High	Low	High	-		Reverse
	High	High	Low	High	-		
High	Low	Low	-	-	-	Aperture	
	High	Low	-	Low	High		Forward
	Low	High	-	High	Low		Reverse
	High	High	-	High	Low		

Note : "-" indicates the output off state. (high-impedance)

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